

International Journal of Clinical Obstetrics and Gynaecology

ISSN (P): 2522-6614
ISSN (E): 2522-6622
© Gynaecology Journal
www.gynaecologyjournal.com
2018; 2(1): 13-15
Received: 05-11-2017
Accepted: 06-12-2017

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Assessment of platelet count and its correlation with severity of pre-eclampsia: A comparative cross-sectional study

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Abstract

Background: Pregnancy induced hypertension (PIH) is the most common medical disorder of pregnancy contributing significantly to maternal / fetal morbidity & mortality. Hematological abnormalities ranges from thrombocytopenia, raised liver enzymes, hemolysis to DIC and are the most ominous complications related to PIH. This study was conducted to assess the platelet count and its correlation with the severity of pre-eclampsia.

Methods: A 1 year cross-sectional study was conducted in year of 2016 over 200 patients who attended labour room. Among them 100 normotensive women were included in control group and 100 women with BP 140/90mmHg and above, proteinuria, and eclampsia were included in the study group.

Result: Among the 100 PIH cases, majority belonged to age group of 20-25 yrs with a mean of 22.74. 66% of PIH were primigravidas and 53% belonged to 37-40 weeks of gestation, 68% cases were severe pre-eclampsia and 16% Of the cases had thrombocytopenia.

Conclusion: This study gives an outline of investigation to be done which alerts the physician of the severity of the disease so that appropriate and timely management can be initiated. Estimation of platelet count being simple economical and rapid investigation can be used for early detection of severity of preeclampsia and to prevent further mortality and morbidity.

Keywords: Pregnancy induced hypertension, DIC (consumption coagulopathy), hemolysis, thrombocytopenia, raised liver enzyme

Introduction

Pregnancy induced hypertension (PIH) is the most common medical disorder of pregnancy contributing significantly to maternal / fetal morbidity & mortality^[1].

It's a global problem complicating 10-17% of pregnancies^[2]. The incidence in India ranges from 5-15%^[3].

Pre-eclampsia is a multisystem disorder of unknown etiology characterized by development of hypertension of 140/90 mmHg or more with proteinuria after 20 weeks of in a previously normotensive and non-proteinuric patient. Severe pre-eclampsia is characterized by blood pressure of >160/110mmHg, proteinuria of more than 5g/24hrs, sudden oliguria, cerebral or visual disturbances, HELLP syndrome, severe epigastric pain, retinal hemorrhages and laboratory parameters demonstrating thrombocytopenia, hemolysis or abnormal liver function tests^[4].

The majority of patients remain in mild to moderate group and does not have any major obstetric problems. However in certain percent of patients, the risk to mother as well as fetus can be significant. Possible development of DIC, intracranial hemorrhage, renal failure, retinal detachment, pulmonary oedema, liver rupture, abruption placentae, intrauterine growth restriction, fetal demise, maternal death is always there^[5].

Superimposed HELLP syndrome develops in 4-12% of women with pre-eclampsia or eclampsia^[6]. It is severe form of pre-eclampsia posing significant threat to both mother and fetus. This acronym HELLP was first coined by Weinstein, in 1982, to emphasize the triad of hemolysis, elevated liver enzyme and low platelets.

Thrombocytopenia is the most common hemostatic abnormality seen to occur in 11-29% of patients^[7]. Detection of thrombocytopenia is important as it is one of the preventable factors contributing to some cases of life threatening cerebral and hepatic hemorrhage^[8].

The frequency and intensity of thrombocytopenia varies and depends on intensity of disease process and duration of PIH syndrome. Thus this study was taken up to assess the platelet count and its correlation with the severity of pre-eclampsia.

Methods

Prospective cross-sectional study was carried out in the department of Obstetrics and Gynaecology, SDM college of medical sciences and hospital, Sattur, Dharwad from November 2015 – 2016. A total of 200 women who attended labour room were included in the study among which 100 women were included in control group and 100 women with BP 140/90mmHg and above, proteinuria and eclampsia were included in the study group.

Clinical details were collected from all the cases which included the demographic data, symptoms, examination findings and investigations (platelet counts, LFT, RFT, PT, PTTK, INR, urine for albumin) were done and analysed.

Inclusion criteria

- Age more than 20 years.
- Gestational age more than 20 weeks.
- Women with pre-eclampsia and eclampsia.

Exclusion criteria

- Gestational age less than 28 weeks.
- Pre-existing renal disease, diabetes, endocrine disorders chronic hypertension, ITP, TTP, APLA, SLE.
- Patients on medication which are known to cause thrombocytopenia.

Study method

Ethical approval: The study was approved by the Institutional Ethical Committee

- Among the 100 patients in study group PIH was classified into MILD, SEVERE pre-eclampsia and ECLAMPSIA which were predefined as
 - Mild : Gestational hypertension, mild pre-eclampsia
 - Severe : Severe pre-eclampsia, Imminent eclampsia
 - Eclampsia : those who developed seizures
- A detailed history, clinical findings and relevant investigations were noted for both study and control group.
- Blood samples were taken after informed consent and under aseptic precaution by venipuncture of anterior cubital vein into EDTA and PLAIN bulbs and sample was sent for hemoglobin, total leucocyte count, serology, platelet counts, LFT, RFT, PT, PTTK, INR while urine sample was collected to check urine albumin by dip-stick method.
- Results were recorded and analysed to fulfill the aims and objectives of the study.
- The data was tabulated in MS Excel, correlation test like chi square test were applied to tabulated data and same was analysed in SPSS17.0.

Results

Test of significance: Calculated chi square-13.488

P value for the above at degree of freedom 3 is <0.001, implying its significance between PIH and Thrombocytopenia.

It is observed that

- Majority of the patients with preeclampsia belonged to age group of 20-25 years.
- -2% of control group women had platelet count less than 1.5 lakhs.
- -2 patients among mild PE, 11 among severe PE and 2 among eclampsia had platelet count less than 1.5 lakhs.

- 66% of the patents of study group were primigravidas.
- Severe pre-eclampsia and Eclampsia both were found to be more in gestational age of 32-37 weeks.

Table 1: Association of pre-eclampsia and Age group

Patients	20-25yrs	26-30 yrs	31-35 yrs
Control	48	45	7
Mild PIH	10	14	3
Severe PIH	30	20	15
Eclampsia	5	3	0

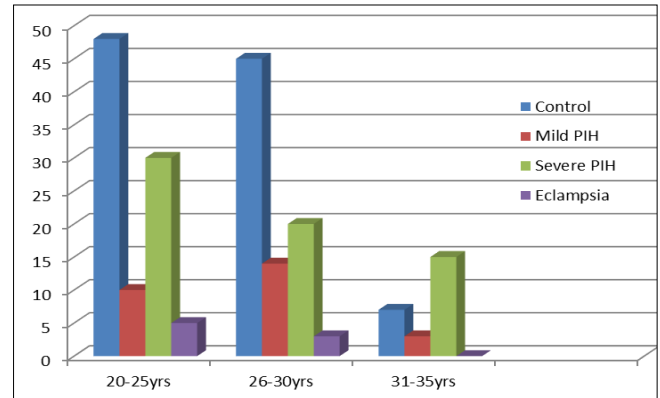


Table 2: Association of Platelet counts and Pre-eclampsia

	Platelets >1.5 lakhs	<1.5 lakhs
Control group	98	2
Mild PIH	3	19
Severe PIH	11	60
Eclampsia	2	5

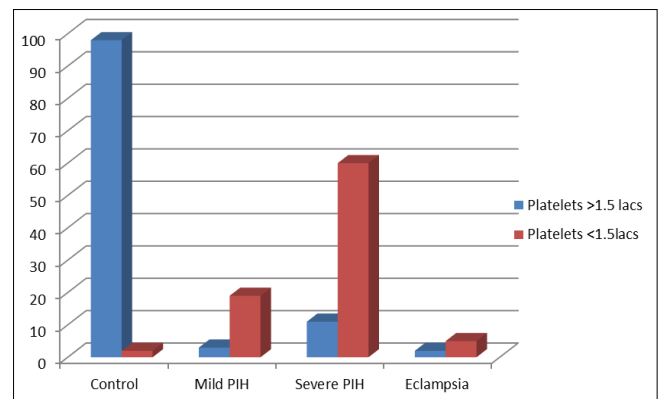


Table 3: Association of PIH and number of pregnancies

	Primigravida	Multigravida
Control group	35	65
Mild PIH	16	6
Severe PIH	42	28
Eclampsia	8	0

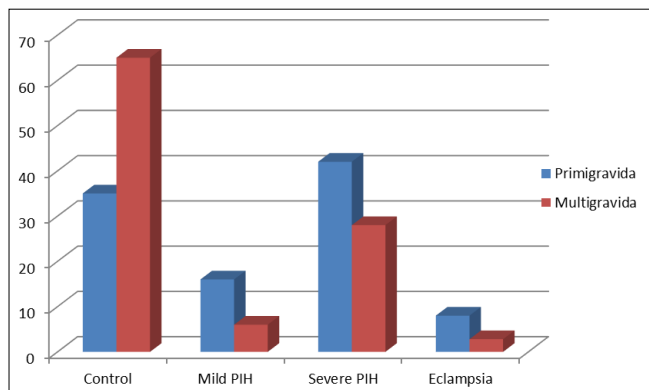
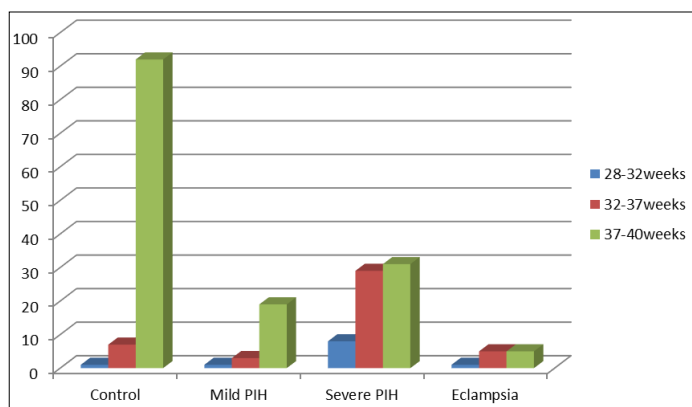


Table 4: PIH and Gestational age

	28-32 weeks	32-37weeks	37-40weeks
Control	1	7	92
Mild PIH	1	3	19
Severe PIH	8	29	31
Eclampsia	1	5	2



Discussion

Pre-eclampsia is one of the major cause for maternal and perinatal mortality and morbidity worldwide, particularly in developing countries [9].

Preeclampsia affects approximately 6% of all the pregnancies, more often in primigravidas in the age group of 20-30 years.

Women with severe pre-eclampsia develop a variety of hematologic aberrations which do have impact on outcome of the patients so that aggressive therapy can be initiated to prevent maternal and fetal/neonatal morbidity and mortality.

Simple investigations such as hemogram, urine examination liver enzymes, coagulation profile (PT, PTTK, INR) helps in detecting platelet abnormalities, red cell abnormalities, and can help in detecting patients who are likely to progress to HELLP syndrome and other ominous complications.

In the present study among total of 100 PIH cases, majority belonged to age group of 20-25 yrs with a mean of 22.74 as compared to Vamsheedhar *et al*, shivkumar *et al*. and prakash J *et al*. studies with mean age of 24.57, 24.3 and 24.75 respectively [10, 11].

In the present study 66% of PIH were primigravidas and 53% belonged to 37-40 weeks of gestation, 68% cases were severe pre eclampsia and 16% of the cases showing thrombocytopenia.

Table comparing different studies with present study for association of PIH and Thrombocytopenia

Studies	Association of PIH & thrombocytopenia
Kelton J G, <i>et al</i> . (n-26)(1985)	34%

Thomas A. <i>et al</i> . (n-80)(1998)	16%
Vrunda J K (n-72)(2004)	41%
Ruchi Verma <i>et al</i> . (n-35)(2015)	31%
Present Study (n-100)(2016)	16%

Thus comparing present study results and interpretation with previous workers studies, estimation of platelet count may be considered as an early, economical and rapid method for assessment of severity of PIH cases. It may also be useful screening test for early detection and to assess the prognosis of the disease and its outcome.

Conclusion

Analysing the above observations and interpretations, the estimation of platelet count being is simple economical and rapid investigation which can be used for early detection of severity of preeclampsia and to prevent further mortality and morbidity. Thrombocytopenia worsens as PIH progresses from gesatational hypertension to Eclampsia [12].

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